W5YI

Nation's Oldest Ham Radio Newsletter

REPORT

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★ *In This Issue* ★

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Spartan Packet Experiment Marks Ham-Space Cooperation

The Space Shuttle Endeavour (mission STS-72) with its crew of six - including Japanese astronaut Koichi Wakata - launched on January 11th. Its primary mission was to retrieve a Japanese satellite.

Veteran commander (STS-45 and STS-57), Brian Duffy (Colonel, USAF), is also a licensed ham radio operator, N5WQW, but this was not a SAREX flight. (SAREX, the Shuttle Amateur Radio Experiment allows ham astronauts to interact with amateur radio operators and elementary school children through 2-meter ham radio contacts.)

But STS-72 did contain an interesting amateur packet radio experiment nonetheless that still permitted ham operator and school participation.

Known by its SPRE acronym, the Spartan Packet Radio Experiment was one of four experiments contained within the releasable, reusable rectangular spacecraft. The Spartan spacecraft for this mission was called the OAST- Flyer, also known as SP-206. (OAST stands for NASA's Office of Aeronautics and Space Technology.)

The STS-72 Space Shuttle mission was the sixth time that the Spartan hardware has been flown. Headquartered at Greenbelt, Maryland, the Spartan Project is designed to provide an easy and inexpensive access to Earth orbit via the Space Shuttle for science experiments that need to take measurements in orbit ...but away from the Shuttle.

The Spartan spacecraft is a free-flying cube-shaped experiment "carrier" (about 3 feet by 4 feet by 5 feet high) which can be accessed from the ground by radio. It was deployed on Sunday, January 14 by the shuttle's robot arm. After deployment, the shuttle moved away from Spartan. The battery-powered technology spacecraft/platform then automatically took over and began performing its mission according to a preprogrammed routine.

The Spartan Packet Radio Experiment

SPRE was developed and built by the University of Maryland Amateur Radio Association (UMARA) with assistance from NASA, volunteer engineers, and software from professionals. The aerospace company known at the time as Martin Marietta provided a grant. NASA donated parts including space-rated electrical connectors and a sealed box to contain the equipment -- actually an old battery box -- that had already flown in space.

SPRE's primary mission was to test the feasibility of satellite tracking using amateur packet radio in conjunction with the Global Positioning System. The GPS uses multiple satellites to provide worldwide positional fix capability. This is accomplished by measuring the propagation time of satellite signals at the GPS receiver.

Kenneth McCaughey, N3FZX, former UMARA president, is the payload manager for SPRE. He is an electrical engineer at satellite manufacturer CTA. This company is the NASA contractor

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responsible for the SPARTAN spacecraft.

"SPRE is the first radio of any kind to fly a SPARTAN mission," McCaughey told us. "The mission went really well; however, we do not know why the SPRE transmitter turned off early." The SPRE radio -- an ICOM IC 2AT connected to a PacComm HandiPacket TNC -- was activated by a timing device two hours and 41 minutes into the flight. It operated for 17 hours 20 minutes, when suddenly, while making a pass over a ground station, the unit fell silent. Reasons why this occurred could surface as program personnel review the contents of onboard data recordings from the OAST-Flyer.

Ground stations transmitted their locations to SPRE, and if heard, SPRE relayed GPS information back to Earth. Communications were conducted without packet connections between the spacecraft and the ground station; instead, unconnected information <UI> frames were used.

Both uplinks and downlinks were at 145.55 MHz. All ground stations within range of SPRE were able to see the relayed station locations plotted on a map, with the popular APRtrak software -- used to track locations of people and objects in public events using amateur packet radio. APRtrak can plot and track both fixed and mobile ground stations, and in its SPRE application it plotted the positions of stations and objects using SPRE transmissions. The software also decoded and displayed other SPRE housekeeping telemetry such as internal temperatures, voltages and system status.

This type of technology has many applications for both the amateur and commercial world. It seems likely that low-Earth orbit satellites will increasingly be used to collect location data from ground targets for downloading to a central ground control station or many remote stations. Thought also is being given to incorporating the GPS tracking technology into future amateur radio spacecraft.

The operational aspect of SPRE included many amateur radio stations throughout the world, including about 20 schools. There were two levels of participation; amateur radio stations capable of transmitting through SPRE and those capable of receiving and displaying the data using a simple two meter radio and APRtrak software.

Ground control stations were linked together over the Internet, using PC software written for this purpose. "When SPRE flew over Australia, we in Maryland could see the real time data from the spacecraft, being received and decoded by the Australian station," N3FZX said. Besides U.S. and Australia, other participating countries included Colombia, Cuba, France, Honduras, Hong Kong, Hungary, Japan, Mexico, New Zealand and Spain.

Besides SPRE, the other three experiments on the OAST-Flyer are also interesting. SPRE transmitted some data from these other experiments, permitting experimenters to get an idea of their experiments' functions while the spacecraft was in operation.

REFLEX was an experiment designed to verify computer-generated models of the contamination encountered by instruments and spacecraft in space. REFLEX also studies the erosion of payload surface coatings as a result of chemical reactions.

GADACS was an experiment to demonstrate the ability to use data derived from the Global Positioning System (GPS) as the sole means of controlling vehicle attitude. Two GPS receivers, each with its own set of four GPS antennas, were installed on the OAST-Flyer spacecraft.

Some of the variables being considered are orbital velocities, Doppler shifts, and thermal drifts. Other factors are the performance limitations of the GPS attitude sensing equipment and whether GADACS can remain locked onto the GPS satellites during maneuvering of the Spartan spacecraft. For the last portion of the mission, GADACS assumed control of the vehicle, using only GPS-derived attitude for attitude control.

The SELODE (Solar Exposure to Laser Ordnance Device) experiment tested the reliability and safety of laser-ignited pyrotechnics on spacecraft. These devices are small explosives that are used to detach or operate spacecraft parts. For example, an explosive charge may be used to break a clamp holding down a spring that ejects a satellite.

Space pyrotechnic devices are electrically operated. They could be affected by electrical or radiofrequency interference or static discharge. In contrast, laser pyrotechnics are ignited by laser pulses traveling through fiber optic lines which are not vulnerable to such interference.

SELODE studied whether natural, low-orbit, solar energy can inadvertently fire laser pyrotechnics, and how the space environment affects these devices. SELODE was the first experiment to test these devices on a shuttle mission.

At the conclusion of its science operations, Spartan maneuvered into the proper orientation for retrieval and awaited the Shuttle's arrival. The rendezvous took place after Endeavour's engines were fired about two hours before the planned capture. The spacecraft had flown free of the shuttle for about fifty hours. On the fifth day into the flight, the OAST-Flyer was grappled by the robot arm and returned to its berth in the cargo bay for return to Earth and future reuse.

The STS-72 mission lasted 8 days, 22 hours, 22 minutes. At the end of its 3.7 million-mile trip,

Endeavour landed at KSC on Saturday, Jan. 20 at 1:42 a.m. CST (07:42 GMT). The STS-72 mission was the tenth mission for Endeavour ...and the 74th for the Space Shuttle Program.

The University of Maryland Amateur Radio Club is now analyzing all of the received data files and an overview of the success of the mission will be made available to all schools and radio amateurs.

AMATEUR RADIO TO FLY ON STS-76

The Shuttle Amateur Radio EXperiment, or SAREX will next fly again on Shuttle Mission STS-76 set for launch March 21, 1996 at 0834 UTC (3:34 AM EST) from the Kennedy Space Center, Cape Canaveral, Florida. The launch vehicle will be the Space Shuttle Atlantis.

STS-76 is the third flight in Phase one of the joint American-Russian Shuttle-Mir series of missions. Phase one includes seven planned Space Shuttle-Mir missions between 1995 and 1997, including rendezvous, docking and crew transfers. The Space Shuttle will assist with crew exchange, resupply and payload activities for Mir. Russian cosmonauts have flown on two shuttle missions already, STS-60 in 1994 and STS-63 last year. Four or more U.S. astronaut stays aboard Mir are planned, totalling nearly two years of on-orbit time.

Phase two is the joint development of the core international Space Station. Phase three is the expansion of the Space Station to include all of the international partners.

Landing of STS-76 is scheduled for March 30, 1995 at 1707 UTC (12:07 AM EST) at the Kennedy Space Center, Florida. (9 day mission.)

Among those in the crew who hold amateur licenses are, Astronaut Richard A. Searfoss, 39, KC5CKM (Portsmouth, NH) who will serve as the Shuttle's Pilot, Mission Specialist Dr. Linda M. Godwin, 43, N5RAX (Jackson, MO) and Dr. Ronald M. Sega, 43, (Colorado Springs, CO) KC5ETH. The remaining crew members include Commander Kevin P. Chilton, and Mission Specialists Shannon W. Lucid, 53, (who is expected to have her amateur license by launch time) and Michael R. Clifford.

Shannon was born in Shanghai, China, but considers Bethany, OK her home where she graduated from high school. She has a Ph.D in biochemistry from the University of Oklahoma. Her parents still live in Bethany.

This will be Linda Godwin's third shuttle flight. She used ham radio aboard the shuttle Atlantis during STS-37 in April 1991, and from aboard Endeavour during STS-59 in April 1994.. Searfoss last operated SAREX from the Space Shuttle Columbia during mission STS-58 in October/November 1993. This will be his second Shuttle flight. Ronald Sega used SAREX from Discovery during the first joint US/Russian shuttle mission, STS-60, in February 1994.

During the mission, the shuttle will rendezvous and dock with the Russian Space Station Mir. Later, the shuttle will return to Earth, leaving Shannon Lucid with Mir for a 5 month stay aboard the Russian space complex. Lucid has been training for nearly a year in Star City, Russia in preparation for this mission. She has flown four times previously aboard the Shuttle.

The STS-76 launch will place the shuttle Atlantis into Earth orbit at an altitude of 196-245 statute miles (315-394 km) and an inclination of 51.6 degrees.

During SAREX missions, the astronauts will typically make Amateur Radio scheduled contacts with schools, personal contacts with family members and random contacts with the Amateur Radio operators.

The Shuttle Amateur Radio EXperiment (SAREX) is sponsored by the American Radio Relay League (ARRL), The Radio Amateur Satellite Corporation (AMSAT) and The National Aeronautics and Space Administration (NASA). SAREX is supported by the Federal Communications Commission (FCC).

There is also a shuttle mission (STS-75) scheduled for later on this month (Feb. 22), but we see no evidence that it is a SAREX flight. *(Thanks, NQ1R)*

■ **CB Radio is apparently not dead!** CQ has just introduced a third new magazine! In addition to its new CQ VHF and CQ Contest, CQ Communications has now added "CB Radio Magazine." It becomes the only nationally-distributed monthly publication for the CB enthusiast. CQ says that there are an estimated four million loyal active CBers.

■ **The American Radio Relay League has just raised their QST advertising rates (effective with the February issue) six percent** "...due to a 50% increase in paper costs and substantial increases in shipping Second Class mail." ARRL membership (QST readers) is 172,000 "...with a total print run of 205,000 to accommodate our new newsstand sales." We heard a rumor, however, that newsstand sales are poor. The ARRL did not release newsstand sales or magazine returns which we heard were very high.

■ **Some 60 competitors from 15 countries took part in the 1995 World HST (High Speed Telegraphy) Championships held in Siofok, Hungary.** The overall best results was obtained by Oleg Bezzoubov, UA4FBF of Russia who copied 320 letters (64 wpm) and 520 numbers per minute based on the PARIS standard. Mixed text winner was shared by Andrei Dindasov EU7KI (Belarus) and Djurica Maletin, YU7DR (Yugoslavia) at 280 characters/minute or 56 wpm.

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Technology on the Way

■ **Point, shoot and compute! Eastman Kodak has a new digital camera** that is primarily designed for professionals (such as insurance adjusters and real-estate salespeople) who need quick photos. It uses no film, instead the camera stores the photos on a credit card size removable memory disk. Cost is "under $1,000."

■ **Watch for the debut of "Microsoft Phone,"** a new interactive voice response (IVR) system. Rumors are that it will eventually be added to the Windows 95 operating system. With it you will be able to get your PC to respond to voice commands such as "Computer: launch..." a specific applications program. It works by associating macro keystrokes with spoken words.

MS Phone can also be programmed to call your cellular phone and let you know that you have a specific number of phone calls, e-mail messages and faxes on hand ...or function as an answering machine. You can even have your PC "read" back all of your spoken and written messages when you call your computer from a remote telephone. In the office, MS Phone acts as a voice-activated telephone keeping track of those you call (and if you have Caller ID) ...those who call you. It also has widespread application for the visually handicapped.

■ **The familiar "I'm sorry, he is away from his desk," will become a thing of the past if AT&T have their way.** They have developed the cell-phone extension. Basically a radio transmitter/receiver, the device rings both an internal office desk phone and the user's carry-about cellular phone.

■ **VHS cassettes to go the way of the LP record album.** Worldwide sales of Video CD players are outstripping those of Audio CD players. They aren't (yet) available in the U.S. but are huge sellers in Asia. Sony and Panasonic (among others) make them.

■ **We have all heard of the popular "Uninstaller" software.** These are computer programs that get rid of all the remnants of Windows programs that you want to eliminate from your system. Now there is a "UnGame" program whose only job is to root out and get rid of games installed on office PC's. It doesn't help to rename the Solitare game since "UnGame" looks for game programming code rather than files.

The Internet PC

■ **More information is surfacing about Oracle's new "NC" ...as in Network Computer.** The "under $500" Internet "web machine" was designed by Oracle's R&D team, but Oracle (a software house) say they will not manufacture it.

Instead (for a licensing fee) they are offering the design and schematics to any hardware firm interested in producing the NC. And we understand that several far east and European manufacturers (including Italy's Olivetti) are indeed interested. The key to the mass-market PC is bullet-proof simplicity and cost ...not power and features.

People who have seen the NC specs say it is a network terminal with 4MB of memory, a ($30) ARM-7500 microprocessor and no storage capability. Included will be a keyboard and a mouse. Its size is very small ...about eight inches square and only two inches high. A prototype was shown in Japan at an industry conference last month. Manufacturing partners are scheduled to be announced next month with production planned for year end.

To save money, one version uses a TV set as the monitor. You do not need an operating system ...or even an application program for that matter. Instead you will "borrow" them from the net as part of your online fees. The Internet is the platform.

Computing keeps getting less complex and dramatically less costly. First it was the million dollar mainframe with IBM at the forefront. Next came the thousand dollar PC ...with Intel and Microsoft in charge. Will the $500 Internet terminal "box" be next?

We also understand that a cable-TV "Internet Channel" is being tested in Atlanta. Users pay a monthly fee for "WEBster" hardware and an Internet connection. Web TV is cheap and cable modems can turn one-way analog television into fast two-way interactive full motion video with digital sound.

A 14.4 kilobit telephone modem takes an hour and a half to download a 10 Megabyte video clip. A cable modem can do it in 15 seconds at 40 MB/second! You can expect them to be widely available next year. And with it will come even greater Internet interest. Cable operators are quietly placing big orders for them with Motorola, Intel, Toshiba, Zenith and Hewlett-Packard. The cable data boxes now cost around $400 but should drop to around $150.

In another development, a digital "Smart Phone" operating system is being licensed by a California company which features electronic mail, faxing and Internet connections.

■ **Every telecommunications medium will be impacted if multimedia Web use "takes off."** Financial markets are already considering the possibilities. And so are the politicians. Do you remember how "First Momma" appeared during the CB days of the seventies? It was the first lady's "handle."

Well, right now Lamar Alexander, Pat Buchanan, Bob Dole, Steve Forbes, Phil Gramm, Richard Lugar and Bill Clinton all have campaign Web sites. Even Ross Perot has gotten into the act with his http://www.uwsa.org - (United We Stand America).

It is the CB craze all over again. The FCC even says it is OK to solicit campaign funds over the Internet. Another firm is setting up "America's Voice" to do political polling. How far behind is Internet voting?

Consumer Online Update

■ **Maybe it is a coincidence, but top "insider" executives are now cashing in millions of dollars worth of America Online shares** ...including AOL president Steve Case. Could they be concerned about how well commercial online services will compete in what is fast becoming a World Wide Web world? In December 1994, AOL stock was selling for $10.00 a share. A year later it was $40.00.

■ **The Internet's popularity threatens to swamp online services.** Millions of users are bypassing commercial online services and connecting directly to the Internet's World Wide Web which is only five years old. Even Microsoft miscalculated the Web's popularity.

Their "MSN" Microsoft Network "alternative" to the Internet suddenly became a Web site. The Web is growing much faster than online services. In the past year, the number of active Web users has jumped from one to eight million. Advertisers are also finding that they can bypass middleman media costs if they go straight to the Web,

■ **Market leaders Netscape (with 85% of the Web browser market) and America Online (with 4.5 million subscribers)** are forming an alliance whereby they will exchange their products and expertise in an effort to bolster their position against a fast charging Microsoft. AOL users will get the latest Netscape offerings quicker ...in exchange, Netscape further expands its market penetration and gets access to AOL's marketing know-how. (AOL doubled their subscriber base in one year and about 250,000 people are joining the service monthly.)

■ And speaking of alliances, **Netscape is reportedly working with the firm that processes most of the credit card purchases in the U.S.** Verifone confirms credit card validity and limit status to three-quarters of the nation's merchants. When a credit card's magnetic stripe is passed though a reader, chances are that Verifone technology is being used. Netscape wants its merchant server users to be able to quickly and automatically ascertain online when a credit card can be accepted. Since Verifone already accepts credit card payments through bank affiliations, consumers would not have to open an additional Internet credit card payment plan or use special software.

■ **IBM and Sears are fast becoming disenchanted with their joint online "Prodigy" venture.** Together they have spent over $1 billion trying to get it going, It has never made money.

Once the number one online consumer service, "Prodigy" now languishes in third place with 1.5 million subscribers. (As mentioned, AOL is number one, CompuServe: 4 million.) The Microsoft Network (MSN) already has reached 500,000 subscribers in just four months and is coming on strong.

Both IBM and Sears are now looking for a buyer for Prodigy ...the price: as much as $500 million. AT&T which is in the process of dumping their Interchange network supposedly was interested, but IBM is opposed to selling to a firm they consider to be a competitor ...especially one that could develop it into a powerhouse.

Don't be surprised if either of the top two online services end up buying Prodigy for its subscriber list. Actually, the future for commercial online services as it now exists looks dim in general. Fast, inexpensive direct Internet access is indeed the future.

While Prodigy's future remains in doubt, they keep plugging along. Next month they will open a Virtual Mall that eventually will be available to anyone on the Web. They will also use a technology that will track users' moves through the mall to determine what people want.

■ **AT&T is now developing its own Internet-based consumer service.** So far their online service has been business oriented but that will change about mid-year when they will add new general interest features.

And add GEnie, General Electric's consumer on-line service (with under 100,000 subscribers) to those which are migrating to the Web. General Electric is selling the service which too will reappear as a Web site.

■ **Be on the lookout for AT&T's entry into the booming satellite TV market.** They just anteed up nearly $140 million to Hughes Corp. for the right to sell DirecTV's direct broadcast television to their telephone customers. A single bill will contain both long distance telephone and satellite-TV charges. AT&T is also very interested in getting into interactive computer services that could become available over Direct Broadcast Satellite systems. DirecTV already has 1.25 million subscribers and growing fast. Hughes, by the way, has another service on the way called DirectPC which downloads computer data but not DBS television.

Internet Regulation

The signs increase that the World Wide Web could go down the same path taken by broadcasting in the 1920's. That was when the amateur radio operator ruled the airwaves and broadcasting was in its infancy. Without rules, everyone transmitted in the same band and chaos ruled. Shortly thereafter, the ITU adopted its first frequency allocations spelling out who could do what on the airwaves ...and where it could be done.

The U.S. government also took action when the sales of radio receivers began slowing down. There was just too much noise and the bedlam was affecting business and the economy. Amateurs were promptly hustled out of the prime (360 meter) broadcast band.

The *Radio Act of 1927* brought some semblance of order to the radio spectrum and free broadcast radio and business blossomed ...financed by advertising. It was a Pittsburgh amateur, Frank Conrad, operator of station 8XK who actually determined how radio broadcasting would be financed. His garage broadcasting of music and news sold big quantities of radio receivers. When Frank announced where receivers could be purchased, they quickly sold out. That station became KDKA, the nation's oldest (and still operating) broadcast radio station.

There is a definite resemblance between the early days of radio broadcasting and the early days of wireline networking. Neither mode ever anticipated that the medium could reach saturation.

Right now, anyone can go online - "amateurs" right beside the "big boys." We have seen hundreds of student "home pages" (some of very questionable content) on classroom servers being poured into the Internet. (One college girl specializes in dirty jokes!)

All three consumer online services provide programs with which you can publish your own Web pages. (AOL has *Personal Publisher*, CompuServe has *WebCentral Home Pages* and

Prodigy: *Personal Web pages.)*

■ **"Back bone" Internet volume keeps being added all the time** by large telecommunications corporations. The radio spectrum was eventually found to be limited. What is the capacity of the Internet? We all know that the Net slows down when traffic is heavy.

Big business is fast moving to the Internet. Direct product sales, home banking, publications, broadcasting, corporate presentations - you name it - share the same "bandwidth" as information servers and personal home pages. Is there a limit?

■ **Just last week the Schick Shaving Products Group signed on** as the first advertiser of the NBA's Web site at: http://www.nba.com. You'll see their logo as the sponsor the NBA's "Rookie Report Presented by Schick."

■ **Broadcast journalism is heading to the Web.** Microsoft is developing a short term (Feb. 8 to March 25) Web site for the Academy Awards and the Super Bowl. Big corporations are spending "big bucks" to sponsor the Web sites. The Oscars attract more than 1 billion TV viewers across the world. Microsoft is looking for 1 million Web users to access the Web site - http://oscars.guide.com - which will permit PC users to call up video clips. The Super Bowl Web site is located at: http://www.superbowl.com.

Microsoft is also adding a monthly **broadcast "Cyber Talk"** show to its Web site this month featuring former NBC News Overnight TV anchor, Linda Ellerbee. Debut: Feb. 21 at 9:30 p.m. EST: http://www.microsoft.com/encarta

The quality of the video won't be good. At least not yet. Microsoft is counting on the prospect of a big jump in data rates that should be coming next year. When video hits the Internet, you can expect "big time" Internet congestion!

■ **While it hasn't been announced yet, the NewsCorp/MCI/Delphi joint consumer online venture we understand will be called "iGuide."** They are looking for advertisers who will be charged 2¢ per Web page "hit."

■ The *New York Times* newspaper is moving to http://www.nytimes.com. They will eventually charge for domestic access. (For $120,000 a year, you can advertise on their Web site!) *USA Today* tried a $14.95 monthly subscription fee which was later discontinued. (http://www.usatoday)

■ **Will there be a point when the international and national regulators will have (or want) to step in - just as they did in the 1920's?** If history is any indication, it will happen. The impact of the U.S. economy will be just too big. We foresee lobbyists putting pressure on Congress (who need to cut the deficit) to regulate the Internet. It has already started.

By law, the FCC has regulatory powers over all wireline ...as well as radio telecommunications. No one ever thought ten years ago that the Government had the power to auction off the radio spectrum ...especially after it had been given away for decades. Don't be surprised if Internet access is eventually sold or taxed ten years (or less) from now.

The Sinking Technology Ship

■ **It looks like the sales of personal computers are slowing down.** If we are reading correctly between the lines, big electronics retailers (such as Best Buy and Circuit City) did not sell the number of PCs they thought they would last fall. Best Buy's stock is down more than 50% in just four months and they are asking suppliers for an extra 30 days in which to pay for their Christmas inventory, much of which they still have.

And cash-flow strapped Packard-Bell had to get a "loan" from Intel to finance their manufacturing. Dell Computer's stock has been falling like a rock. It was nearly $50 in Nov. ...now it is $25. Even the sales of Microsoft's Windows-95 dropped significantly.

The bottom line seems to be that the supply of personal computers has finally caught up with demand. Not only that. There is a growing fear in the financial community that PC hardware and software sales will decline in view of the anticipated revolution in how America processes information. The thinking has shifted to the Internet ...and fast cable modems and low-priced Web "appliances" that don't need software.

With what appears to be excess product in the PC pipeline, it might be a good time to go shopping. Sony is not convinced the PC market is saturated, however. They recently announced that they will launch a new Sony PC line later on this year.

Both Intel and Microsoft shares are down some 25% from their 1995 high. Their performance is considered the key indicator of the health of the PC industry.

■ **Led by technology issues, the stock market dropped some 150 points** in early January when it was learned that a balanced budget compromise will not be forthcoming. And the bloodletting spiralled when it was realized that the big traders who supposedly know what they are doing were dumping high tech stocks. The overall market has recovered, but some technology problems are real.

■ **Apple Computer reported a big ($68 million) loss in the Christmas quarter** - historically the best for PC makers - plus another confusing $125 million "restructuring" charge. Its market share is dwindling (under 10% and falling) and Apple Macintosh software sales are down at a time when Windows programs are increasing.

Apple believes their technology is superior. And it very well may be. But it is not the mainstream standard. The Wintel PC market which in recent years has moved toward the "Apple look" has been growing at some 30% a year ...at least until recently.

Apple is now in the process of replacing their entire marketing department (who abandoned ship) and looking for a new advertising agency. Will we now see Apple swinging more toward IBM-compatible PCs? We think so. Who would have thought that Hewlett-Packard would be the fourth largest seller of IBM compatible PCs.

Many companies are considering buying Apple Computer, including Motorola, Toshiba, IBM, Oracle, Hewlett-Packard, Sony ...and (particularly) deep-pocketed Sun Microsystems who offered $4 billion.

LATE BULLETIN: While denied, the January 24th Wall Street Journal confirmed that **Sun Microsystems is indeed on the verge of buying Apple Computer.** Up until now, Sun has built corporate workstations and Internet servers. They have little experience in consumer PCs.

Sun Microsystems invented the Internet programming language, Java, which permits computer software to be operated from the Internet. Apple is also rumored to have a low price (under $500) Internet access machine in the works, an innovative "Cyberdog" Web browser ...and some new flashy technology coming which no doubt also interests Sun Microsystems.

Apple's major problem is that it has had difficulty competing against IBM compatible PC's and the huge market for IBM compatible programs. One of Apple's major failures was the licensing of its Macintosh graphic user interface "look-and-feel" to Microsoft.

This led to the smash hit "Windows" copy-cat operating system which now inhabits 90% of the world's PCs. The fact remains, however, that Apple remains the model by which user-friendly PC operation and graphics technology is measured.

The Windows operating system can not run Apple Macintosh software. Sun's "Java" programming language, however, can operate on any computer including Macintosh and its use cancels Microsoft's Window's operating platform advantage. With Java, software developers will be able to write a one-size-fits-all program for PCs.

■ **Citing increased cell-phone competition, Motorola posted a big drop in profits** and their stock has fallen some 45% (from $78 to $45.) Although IBM (profits up 41%) and Microsoft (up 54%) reported good quarterly financial figures, Intel while improved - was not up to expectation. Intel stock dropped 10% in one day! Big mutual funds have been dumping technology stocks for nearly two months now.

■ The Wall Street Journal said the manager of the world's largest (more than $53 billion) and most successful growth fund, **Fidelity Magellan, secretly dumped $10 billion worth of technology stocks in the last 60 days.**

To avoid upsetting the financial marketplace (and lowering prices), Jeffrey Vinik used a network of more than a hundred different outside brokers to disguise his intentions ...each selling smaller chunks of his technology holdings. Fidelity also uses an internal brokerage firm which does not disclose which fund is selling what.

When Fidelity Magellan finally disclosed their current holdings, the technology sector nosedived. Analysts said that the market was worried about fourth quarter earnings. The real reason is the investing public may want to bail out now that the bandwagon seems to be heading downhill.

■ **Some Internet stocks were affected. But not Netscape.** In August the company went public at $28. Now six months later, Netscape is selling over $150 - a 500% increase! Last week Netscape split its shares 2-for-1 to get the price down to where the small investor could buy.

Washington Whispers

■ **We hear that massive overhaul of the Communications Act of 1934 is on hold at least until March.** And the massive (280 page) Telecom bill might even be a dead issue. House Republican leaders are now saying that they won't vote on the bill until Clinton agrees to a deal to balance the budget.

Congress and the White House did agree on a stopgap budget that gets essential government agencies funded through September 30th. Although we heard something was being worked out to prevent another shutdown of "non-essential" agencies, NASA, the FCC and some others only have funding through January 26th.

The budget impasse is based on Clinton's hesitancy to cut or restructure federal entitlement programs. The White House believes the budget can be balanced without affecting health and welfare programs. Many observers question whether President Clinton and Congressional Republicans will ever compromise on a long term balanced budget. By law, the administration's fiscal 1997 budget must be submitted by February 5th.

The FCC's return from furlough was delayed a few days by the infamous "blizzard of '96." They not only had an three-foot avalanche of snow to deal with, but also a three-foot deep stack of mailbags in the FCC mailroom when they returned.

■ **The FCC will indeed be very busy assuming it is not furloughed again and the new telecommunications legislation is enacted.** Implementing the new telecom reform bill will be a huge task with some eighty major rulemakings on the "fast track".

The Common Carrier Bureau has to react to new local and long distance telco competition. The Mass Media Bureau has to deal with digital TV broadcasting, relaxed ownership rules ...and electronic censorship (the "V-chip" and online pornography). And there are several cable issues (such as sex channel scrambling), set-top boxes and online and telephone service over cable lines.

■ **The current telecom reform bill gives the new digital channels to TV broadcasters.** The old analog channels would be auctioned. Senate Majority Leader Bob Dole still wants to auction off the digital TV spectrum which is causing a turmoil within the GOP.

He says it could fetch up to $70 billion - which could be used towards balancing the budget. The nation's television broadcasters want the spectrum free and say digital auctions will stall the rollout of HDTV (high definition television) and will end free TV.

■ **It is official. The FCC's Washington, DC headquarters will be moving.** The General Services Administration has signed a lease to move the agency's offices to the suburbs in 1997. FCC Chairman Hundt told Congress he needs more funding ($225 million instead of $166 million) to handle the telecom bill and moving expenses.

■ **Get ready for toll free "888" calling.** Toll free "800" numbers are fast running out. The FCC held a public meeting during late January to discuss the rollout of the new "888" toll free number implementation.

1996 YOUNG HAM OF THE YEAR AWARD

The nominating period for 1996 "Young Ham of the Year Award" is now open. This award program, now entering its second decade, is presented annually to a United States licensed Radio Amateur (Ham) who is 18 years of age or younger and who has provided outstanding service to the nation, his community or the betterment of the state of the art in communications through the Amateur Radio hobby/service.

All nominations must be submitted before June 30, 1996 on an official application. Application forms are available for a self-addressed-stamped-envelope mailed to the 1995 Young Ham of the Year Award, c/o Newsline, 28197 Robin Avenue, Saugus, CA 91350.

With continued corporate sponsorship, the award presentation is scheduled take place at the 1996 Huntsville (Alabama) Hamfest held annually the third weekend in August.

The Young Ham of the Year Award program was conceived in 1985 by Bill Pasternak, WA6ITF. His desire is to highlight the accomplishments of the nation's many young radio hobbyists, and to encourage the entry of more young people into Amateur Radio.

Corporate underwriting for the "Young Ham of the Year Award" program is supplied by Yaesu U.S.A. Corporation and CQ Magazine.

Past recipients of the Young Ham award, all of whom epitomize the heart of dedication to their nation include:

1986, Shawn Alan Wakefield, WK5P, Bartlesville, OK
1987, David Rosenman, KA9PMK, Muncie, IN
1988, Jonathan Binstock, NK3D, Potomac, MD
1989, Erin McGinnis, KA0WTE, Topeka, KS
1990, Mary Alestra, KB2IGG, Staten Island, NY
1991, R. S. "Sammy" Garrett, AA0CR, St. Louis, MO
1992, Angela (Angie) Fischer, KB0HXY, St. Louis, MO
1993, Kevin Boudreaux, N5XMH, New Orleans, LA
1994, Allison Zettwoch, KD4CKP, Louisville, KY, and;
1995, Adam Weyhaupt, N9MEZ, Alton, IL.

■ **Bennett Z. Kobb, KC5CW has just published an unusual chart of the U.S. radio spectrum. Titled "America's Airwaves,"** the 22"-by-34" duotone wall chart covers all of the VHF through EHF bands - 30 MHz to 300 GHz. Each band is presented with summaries of how the band is used and proposed to be used, based on latest FCC spectrum allocations. More than 300 bands are profiled. The chart is $15.00 plus $1.50 postage and handling from Tel. 1-800-460-0090. VISA, MC, Discover accepted. The chart may be viewed on the World Wide Web at the following URL: http://home.navisoft.com/nspi/chart.htm. Benn also is the author of the 312-page Spectrum Guide, $34.95.

■ **Glenn Baxter, K1MAN, and his International Amateur Radio Network** has been asked to return a 150-MHz Motorola repeater, 12 hand-held radios and a 1,250 watt Sears generator loaned to the Red Cross by IARN in the aftermath of Hurricane Marilyn. Motorola wants them back so that they can be replaced in their emergency inventory for the next use. IARN had requested that the equipment be an outright gift.

■ **The cat-and-mouse game between police radar and its detection heats up.** The same stealth technology that is used to make military aircraft invisible to enemy radar is now becoming available to the public in the form on non-transmitting police radar scramblers and absorbers.

All police radar units determine target speed by analyzing the frequency change in returned radar echoes. This variation is known as the "doppler shift." The degree of frequency change is converted to target speed in a properly calibrated radar unit. Return echoes as small as a millionth of a millionth of a watt can be detected and evaluated.

The radar "blanker" is basically a receiver which hetrodynes an additional low-power sweep frequency in with the police X, K and Ka band signal. The return echo at the police unit is interpreted as an error since the reading is greatly above or below possible target acceleration. Since the passive reflector is always on, it works with both "instant on" and "constant on" radars. The FCC has reportedly tested the "jammers" and has found them to be legal "non-transmitters."

At the recent Winter Consumer Electronic Show in Las Vegas, one firm had an unusual demonstration of passive radar jamming. A police radar unit and a 75-mph tuning fork - normally used for radar gun calibration - registered 75 mph. The reading was garbled, however, when the tuning fork and radar gun were in line with a passive reflector installed on the back wall of the exhibition hall.

Two states now outlaw passive radar reflectors, Oklahoma and Nebraska. But they are legal in areas (such as Virginia and Washington, DC) that ban radar "detectors." On the other hand, they *look* like a detector - which it is not. Other new wrinkles in anti-radar warfare is the RAM, Radar Absorbing Material (which does not provide a reflecting surface for police radar) and infrared light transmitters which counters lidar, laser radar guns. (It is not illegal to transmit light.)

■ **The recent snow storm that engulfed the east coast greatly impacted the Internet!** It seems that thousands of people who couldn't go to work turned to their PC for entertainment, electronic mail ...and to work-at-home. The Internet slowed by fifteen percent and telephone access usage jumped 60%.

HAM GETS TO JAIL TERM IN REPEATER DISPUTE.

Ronald R. Ames, WB6RSD of Hesperia, California has been found guilty of three counts of contempt of Court for violating a January 12, 1994 Preliminary Injunction. Ames had been restrained by the San Bernadino Superior County Court from interfering with the equipment and harassing members of the Keller Peak Repeater Association (KPRA.)

He was sentenced to pay a total fine of $3,000 and serve 15 days confinement in the County Jail on the harassment charge. According to the KPRA, its members and directors had been subjected to death threats, malicious interference, harassment, vile personal attacks and threats of bodily injury from Ames and his followers for more than two and one-half years.

Ames, who believes the Keller Peak repeater system is his, had been removed as president of the Association more than two years ago by the KPRA Board of Directors. He first seized the repeater equipment from its berth atop Keller Peak and even after it was returned, padlocked the station premises. A July 1995 Court ruling held that KPRA was the sole owner of the Keller Peak 146.385/.985 MHz repeater equipment, a decision which Ames has refused to accept.

In October 1995, KPRA submitted one hundred seventy-five audio tapes of Ames' and his disciples malicious interference and intentional jamming conduct to the FCC. No action has yet been taken to remove Ames from the airwaves.

It is Ames' contention that a county court has no authority over the use of federally licensed amateur radio frequencies. He said he will therefore not change his conduct. Attorney Richard L. Anglin, N6KUB, legal counsel for KPRA pointed out that Ames was convicted of harassment and contempt of Court which indeed falls under the jurisdiction of California civil law. Ames is scheduled to begin serving his jail sentence on Feb. 7, 1996.

FCC IS BACK ISSUING AMATEUR RADIO LICENSES

After being off on furlough for nearly a month, the FCC is once again back at work ...and issuing amateur radio operator/station licenses. On January 11, 1996, all VEC's were directed to electronically submit the Form 610 applications that they had been holding since December 18th. On Tuesday, January 16th, 1,814 new and 870 upgraded amateur radio operator/station licenses were issued by the FCC. New call sign information can be obtained from the W5YI-VEC (Tel. 817/860-3800) or the ARRL/VEC (860/594-0300) during normal business hours. This information is also available from the University of Arkansas, Little Rock, Web site at: http://www.ualr.edu.doc/hamualr/callsign.html

FORMER AMSAT CHAIRMAN DEAD AT AGE 71

Former AMSAT Chairman John W. Browning, W6SP, died Wednesday evening, January 3, after an heroic three year battle with kidney cancer.

John Wayne Browning was born in Terra Alta, West Virginia on May 18, 1924. As a young B-24 pilot in WWII, he flew 40 combat missions and was badly wounded by flak in a mission over Italy in 1944. Although bleeding profusely, he managed to return to base and save both his crew and his aircraft. For his skill and tenacity he was awarded the Distinguished Flying Cross and the Purple Heart.

After service in World War II, he attended West Virginia University where he met his wife Myrnie and earned a Bachelor's Degree in Electrical Engineering. John flew F-86s during the Korean conflict.

In the Sixties, Colonel Browning began a long relationship with missiles and space as he was assigned duties associated with the Atlas missile program at Norton Air Force Base in San Bernardino. Persons working with John on those early elite teams included individuals who later went on to very high office such as Dr. Albert Wheelon, President of Hughes and Dr. John McLucas, former Secretary of the Air Force, head of the FAA and head of COMSAT Corp.

John's final Air Force assignment in the early Eighties was as chief of communications satellite systems at the Los Angeles Air Force Station where he oversaw the development and acquisition of several classes of military communications satellites. He was central to the development of the "MILSTAR" class of communications satellites.

After a brilliant Air Force career spanning nearly four decades, "Colonel Electric" as he became known to colleagues, retired in 1982. He was awarded the Distinguished Service Medal, the highest peacetime award, for his work in support of national security in various space and satellite projects.

After retirement, John founded his own consulting practice under the company name Altaspace combining the name of his home town, Terra Alta, with his primary professional interest.

W6SP became AMSAT Chairman of the Board in 1982 and led the organization through an important transitional period in which AMSAT became a much more internationally based group and when it undertook grander projects such as the Phase 3 series of elliptical orbit satellites. One of his principal achievements was his ability to herd the diverse approaches and egos of the AMSAT "brain trust" into a fairly compact consensus corral. His chief tools were humor, patience and self-discipline.

Interment was at Arlington National Cemetery on Tuesday, January 16 at 9 AM. *(Thanks, WA2LQQ)*

YEAR END CENSUS OF AMATEUR RADIO OPERATORS

Year	Extra	Advanced	General	No Code Technician	Tech Plus	Novice	Total	Increase
1978	22498	83436	118808		68738	62856	356336	
1979	24232	84981	122783		69022	61436	362454	1.7%
1980	26613	88715	123904		70061	72588	381881	5.4%
1981	29768	94428	125747		76976	80162	407081	6.6%
1982	31530	94588	119684		74703	88799	410304	0.8%
1983	34511	95771	118223		77298	85823	411626	0.3%
1984	36149	97765	116963		80680	80599	412156	0.1%
1985	38495	97959	117107		83579	78616	415856	0.9%
1986	41082	97771	115715		85312	79882	419762	0.9%
1987	43902	98610	114398		93466	83013	433389	3.2%
1988	46885	98681	113082		101495	80168	440311	1.6%
1989	50324	102141	117153		115427	85747	470792	6.9%
1990	53836	105309	119796		127427	93875	500243	6.3%
1991	57488	107642	122592	28152	129889	97354	543117	8.6%
1992	61319	109882	125207	59833	132351	99065	587657	8.2%
1993	65277	112637	126898	92868	134813	99105	631598	7.5%
1994	69495	115882	129356	128295	137275	98307	678610	7.4%
1995	72380	117089	129962	149745	139738	97080	705994	4.0%

Average Number of Examination Applicants Per Month & Year - (First time and upgrading amateurs)

	Extra	Advanced	General	Technician	Tech Plus	Novice	Total
New	6	10	57	2212	249	75	2609
Upgrade	298	365	421	0	411	0	1495
Per Month	304	375	478	2212	660	75	4104
Per Year	**3648**	**4500**	**5736**	**26544**	**7920**	**900**	**49248**

THE AMATEUR RADIO MARKETPLACE

Many of our readers are members of the Amateur Radio industry. One of the most common questions we get is "What is the size of the Amateur Radio Market?" ...and how many join the ranks monthly.

The answer to that question is not as easy to answer as you might first think. There are many variables ...and missing information.

No-Code Technicians began showing up on March 12, 1991. That was when the first license was issued. We know how many Technician licenses were issued by the FCC, but we really do not know how many of those were Tech Plus and how many were No-Code Technicians because the FCC did not begin "splitting" them out until 1994. Their old Honeywell computer did not have the capability to keep track of No-Code Technicians.

Between 1991 and 1994, the information was kept by the VEC's in what came to be known as the "Tech Plus Database." This was a list of examinees who had passed a 5 words-per-minute Morse code test.

The FCC converted to a new PC-based computer system in 1994 and with it came the capability to add a sixth amateur radio class - the No Code Technician. All of the Technician Plus data that had been kept by the VECs in their database was then entered into the FCC's database. The actual No-Code figures between March 1991 and 1994 were not really known.

To make matters worse, there were some "bugs" in the FCC programming that had to be worked out and some census figures were not accurate. We do know how many Technician Plus operators there were at the end of 1990 (127,427) since every Tech had passed a code test up until the first license was issued on March 12, 1991. We also knew the (supposedly) correct number of No-code Technicians there were at the end of 1995 (139,738) since the VEC's Tech Plus data had been entered into the FCC's new computer system. Assuming (1) fairly straight line growth of the Tech Plus class and (2) that the No-Code Tech database maintained by the VECs was properly handled - we are able to faily accurately extrapolate the No-Code Techs at the end of each year. The above figures are the result.

The current average number of new (first time licensed) and upgrading amateurs was determined by taking the FCC's database over the past recent months and averaging the number of new call signs by class. Upgrading amateurs were deduced by taking the number of licensees obtaining a new ten year term.